II. REMARKS

A. Objection to Drawings

Applicant respectfully notes that the Examiner has not complied with MPEP § 608.02(d) because he has not identified the features of the invention specified in the claims that he alleges are not shown in the drawings. Accordingly, Applicant respectfully requests that the Examiner withdraw this objection or make the required identification of features allegedly not shown.

B. Objection to Specification

The Examiner objects to the specification for failing to provide proper antecedent basis for the terms "controllable capacitor," "controllable inductor," and "controllable resistor," as they relate to claims 7-9 and 17-19. Applicant respectfully notes that the specification references such terminology on page 9, lines 11-13. In particular, the specification states:

> Although the propagation delays of amplifiers 222 and 224 are described here as being controlled by varying the bias currents of the amplifiers (i.e. the currents of current sources 228 and 230), the same results can be attained by creating any imbalance in the electrical symmetry between amplifiers 222 and 224. For example, a bias voltage or current can be altered at any node of ring oscillator 221. *Alternatively, a controllable capacitor, inductor or resistor can be coupled to any node to differentially alter the internal impedances in amplifiers 222 and 224.*

Specification, p. 9, lines 7-13 (emphasis added). Accordingly, Applicant respectfully requests that this objection be withdrawn.

C. Claim Rejections

The pending claims have been rejected under 35 U.S.C. § 102(b) in view of Behbahani reference, or under 35 U.S.C. § 103 in view of the Behbahani in combination with the Saeed reference. For the reasons discussed below, Applicant respectfully traverses these claim rejections.

In particular, Applicant notes that Behbahani does not teach an oscillator having at least two phase delay stages, wherein at least one of the phase delay stages has an input for varying or controlling phase delay of the stage. *See, e.g.*, claims 1 and 4.

Fig. 5 in the Behbahani et al. reference is entitled, "ECL divide-by-2 stage", however this diagram in fact shows two differential track-and-hold (D-FF style) stages that are shown as separate square boxes in the Fig 4(b) Block diagram. Frequency dividers which use track-and-hold stages that are driven by non-overlapping clocks (*see* non-overlapping clock generator in Fig 6), are classic digital clock dividers. This is by design, a non-regenerative divider. The purpose of using non-overlapping clocks is to prevent the track-and-hold stages from being transparent. The Behbahani article considers transparency and oscillation (which are the defining characteristics of regenerative oscillators and dividers) to all be problems to be mitigated. (*See, e.g.*, p.158 last paragraph: "if Clk input levels stay at the same level, the divide-by-2 will change to a very good quadrature LO oscillator, which will oscillate...", followed by p. 159, paragraph 1, "All these situations are totally unacceptable... With no LO input signals, both Clk_I and Clk_Q stay high and both latches stay in latched mode which prevents oscillation.").

Thus the "Non-overlapping Clock Generator", shown in Fig. 6, is designed to ensure that this divider does not operate in a truly regenerative mode (*i.e.*, positive feedback with closed loop signal gain greater than 1 at the frequency of operation), by ensuring that the CLK I and Q outputs are large amplitude, non-overlapping digital signals, thus clocking the digital track-and-hold stages of Fig. 5, into well defined logic states.

Furthermore, regarding the track-and-hold stages of Fig. 5, even if they were operated in a transparent mode, which may only be possible by removing the circuit of Fig. 6 and designing a new bias arrangement, there is still no input capability shown to control either the current sources or the loads of each stage independently. Thus, the Behbahani reference does not teach "each of said phase delay stages having an input for controlling the phase delay of the respective stage" (*see, e.g.*, claim 1) or "at least one of the plurality of stages has an input for varying a phase delay of the at least one of the plurality of stages." (*See, e.g.*, claim 4).

A recent article has been published in a respected journal, by students who have employed the teachings of Applicant's invention: *See* "A 5-6-GHz Bipolar Quadrature-Phase Generator", by Aichin Chung and John R. Long, IEEE JSSC Vol. 39, No. 10, Oct., 2004, attached hereto as Exhibit A. *See* section "IV. Frequency Divider" of this article for a good review of the characteristics of a regenerative divider (or injection locked divider). Also see Fig. 8 in the article for an example of an embodiment of Applicant's invention. The article also serves to further establish the advantages of Applicant's invention over the non-regenerative design as described by Behbahani et al. Applicant's invention is acknowledged as reference number [11].

Thus, for at least these reasons, claims 1-7, 9-12, 14-17, and 19-23 should be allowed over the Behbahani reference.

Claims 8, 18, and 23 should be allowed over Behbahani in view of the Saeed reference for at least these same reasons. Furthermore, with regard to the Examiner's rejections of claims 8 and 18, Applicant respectfully submits that the Examiner has not met his burden of factually supporting his position that the claim elements not taught by the cited references would have been "obvious" or "well-known." It is the Examiner's burden to factually support any prima facie conclusion of obviousness. The Examiner's duty may not be satisfied by engaging in impermissible hindsight; any conclusion of obviousness must be reached on the basis of facts gleaned from the prior art. *See* MPEP §§ 2141-2144.

In a recent decision from the United States Court of Appeals for the Federal Circuit, the Federal Circuit noted that when the patent examiner and Board "rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record." *In re Sang-Su Lee*, 277 F.3d 1338, 1345 (Fed. Cir. 2002). Specifically, the Federal Circuit noted that conclusory statements about what is "basic knowledge" or "common sense" by themselves do not adequately support a determination of unpatentability. *See id.* at 1343-44. Thus, the Federal Circuit held that findings of obviousness based on "common knowledge" must be supported by documented evidence that such knowledge exists. *See id.* at 1344-45.

Here, the Examiner has only offered the conclusory statement that "having inductors coupled to the input would have been obvious based on desired input signal consideration because inductors are sensitive to the frequency of input signal." The Examiner has not supported such statement with documented evidence, as he was required to do. Accordingly, claims 8 and 18 rejected under § 103 are allowable over Behbahani in view of Saeed for at least this additional reason.

III. CONCLUSION

In view of the remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, Examiner is requested to telephone the undersigned at (512) 370-2858.

Respectfully submitted,

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CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to COMMISSIONER FOR PATENTS, P.O. Box 1450, Alexandria, VA 22313-1450, on October 14, 2004.

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